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**COHO SALMON ESCAPEMENT COUNTS
IN THE EGEGIK DISTRICT,
BRISTOL BAY, ALASKA, 1996**

By

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ABSTRACT

Adult coho salmon, *Oncorhynchus kisutch*, entering the Egegik River and Becharof Lake system were counted from towers located approximately four kilometers downstream from the outlet of Becharof Lake. From August 7 to September 11, 1996, a total of 24,918 adult coho salmon were counted. Aerial surveys of the Egegik system revealed approximately 9,043 coho salmon in spawning areas.

KEY WORDS: Coho salmon *Oncorhynchus kisutch*, salmon counting towers, escapement, Egegik River, Bristol Bay, aerial surveys.

INTRODUCTION

The Egegik River system (Figure 1) contains two major watersheds: (1) the Egegik River, emanating from Becharof Lake and nearby coastal lowlands, and (2) the King Salmon River, issuing from runoff from the Kejulik Mountains and uplands in the southern portions of Katmai National Park. Both rivers flow into Egegik Bay near Egegik village. A commercial fishery for salmon is conducted near the mouths of these rivers in Egegik Bay and in nearby coastal waters (Figure 2).

Becharof Lake is Alaska's second largest body of fresh water with a surface area of about 458 square miles (Bue 1963). The entire lake lies within the Becharof National Wildlife Refuge. Waters of the lake are clear and support one of Alaska's largest sockeye salmon (*Oncorhynchus nerka*) populations. Additionally, chinook (*O. tshawytscha*), chum (*O. gorbuscha*), pink (*O. keta*), and coho salmon (*O. kisutch*), along with several freshwater species inhabit the watershed. Within the system, Becharof Lake and its tributaries provide the primary spawning habitat for sockeye and coho salmon. The Egegik River between the outlet of Becharof Lake and Egegik Lagoon provides spawning area for all five salmon species.

The King Salmon River is a glacial river and is turbid during summer and fall but supports populations of all five salmon species. Its tributaries provide the primary spawning habitat for chinook and chum salmon in the Egegik system.

Egegik salmon escapements have been assessed off and on by various means since 1920. Foot surveys, weir counts, aerial surveys, float counts, and tower counts have all been employed to provide estimates of escapements for several species (McCurdy, 1973). Counting towers in Egegik River have been used annually to count sockeye salmon escapements since 1957. Escapement estimations have focused on sockeye salmon which provide the largest economic return to the commercial fishery in the Egegik District. Budget constraints have limited the attention afforded to other species. Of all the salmon species, pink and coho salmon escapements have been assessed the least.

Coho salmon have been harvested commercially in the Egegik District (Figure 2) for most of the past century. Their first documented appearance in the commercial salmon case pack was in 1913. They enter the district later than any other salmon species, peaking in the commercial harvest around August 16. In contrast, the sockeye harvest peaks about July 2. Most sockeye buyers have left the area by the end of July. Commercial interest in harvesting coho salmon is for the most part small. It hasn't been worth the salmon buyers' investment in time and labor to keep processing operations open from late July until late August to obtain a few thousand coho salmon. When annual sockeye harvests slowed down buyers ceased operations, leaving little market opportunity for the later arriving coho salmon. This pattern still happens today, though generally, coho harvests have been up since the late 1970's. Harvests since then have ranged from 15,000 in 1979 to 75,000 in 1982, with an average of approximately 43,100 coho salmon. Commercial coho harvests over the past ten years have been fairly consistent (Appendix Table 1), but coho escapement information has been missing.

In order to better understand Egegik coho salmon sustainable yield, and to comprehend more fully the significance of coho salmon in the overall ecological regime within Becharof National Wildlife Refuge, coho escapement data was needed. Efforts were initiated by the U.S. Fish and Wildlife Service to collect daily coho escapement counts and gather coho age composition data from Egegik River beginning in 1994. Using counting towers and equipment made available by the Alaska Department of Fish and Game, daily salmon counts were made at the department's counting tower sites. Following the 1994 season the USFWS and the Alaska Department of Fish and Game agreed to continue the coho counting program in 1995 and in 1996 with USFWS supplying funding for counting personnel and ADF&G supplying the personnel, equipment, facilities, and data analysis. For the results of the 1995 season, see Russell, (1996). This report will cover the 1996 season.

METHODS

Two scaffold counting towers, located approximately four kilometers downstream from the outlet of Becharof Lake (Figure 3,) were left intact after the sockeye salmon counting project ceased on July 17.

The camp was monitored by ADF&G Fish and Wildlife Technicians from the end of sockeye project to the beginning of the coho project. Starting on August 7, three ADF&G Fish and Wildlife Technicians counted all salmon species passing the tower sites until the project was terminated on September 11.

The north bank tower was 7.6 meters high and the south bank tower was 6.1 meters high. The crew was the same crew that operated the project in 1995. Polaroid sunglasses were used by the technicians to minimize glare off the water surface. Painted metal panels were placed on the river bottom perpendicular to the shore to provide a background contrast for fish spotting. Artificial lights were used during hours of darkness to allow counting through the night. Coho passage estimates were derived by expanding 10-minute counts made every hour from each bank. The 10-minute counts were multiplied by six to account for the non-counted portion of each hour. At the end of each day, hourly counts were totaled to provide a daily passage estimate. The data was reported daily to King Salmon via cellular telephone or single-side-band radio. This is basically the same procedure used since the mid 1950's to estimate sockeye passage at counting towers in the major rivers of Bristol Bay.

Aerial surveys were conducted on September 27 and 28, to document terminal areas used by spawning coho salmon and to provide numeric estimates of spawning distribution. This was the third consecutive year for this type of survey. Funding for this year's survey was provided by the Department of Fish and Game and will continue for the next two to three years. The surveys were flown in a Cessna 180 at about 300 feet altitude. Fish were counted by the author.

RESULTS and DISCUSSION

DAILY COHO COUNTS

The first coho salmon were noted at the counting tower site the week before counts actually began on August 7. From the end of July and throughout the season, sport fishing parties of four to five people each, were flown in by air taxis and observed by Fish and Game Technicians taking daily bag limits of

coho salmon. The first day of counting revealed an estimated passage of 876 coho salmon. Given the above information, it is quite likely that a fair amount of coho salmon had already passed the tower site before August 7.

Daily counts of all species observed during the 1996 season are listed in Table 1. The largest daily coho count of 2,016 occurred on August 20, which was one week earlier than last year's peak count. Though coho salmon were still migrating upstream past the counting towers when the project ended on September 11 the daily numbers had been declining. A total of 24,918 coho salmon were counted during the tower project. Daily coho counts, cumulative count totals, and passage percentages by day are listed in Table 2. This year the 50 percent level of coho escapement counting was reached on August 21, which compares to the 50 percent level on August 14, in 1995 and on August 26, in 1994.

SPECIES IDENTIFICATION

Accurate identification and enumeration of migrating adult coho salmon from other migrating species of salmon was not much of a concern this year. Even though there was a large run of pink salmon this year, the experienced crew had little difficulty separating coho from other salmon species. Sockeye numbers were much lower during the operation of this year's project as compared to last year. Chum salmon were scarce, and the large number of smaller, brownish-colored pink salmon were easy to tell from the larger and darker coho salmon. By August 10, coho salmon had begun to exhibit some blush, maroon coloration which can also be helpful in distinguishing them during counting.

The commercial harvest by day of all salmon species from the Egegik District during the period July 27 to August 29, 1996 is listed in Table 3. The catch data suggests that sockeye salmon were more available to commercial fishers in Egegik Bay than were coho salmon through the last week of July. After that, coho salmon predominated in the commercial catches. Given this information and allowing for about a week's travel time from the district to the tower site, this year coho salmon could be expected to outnumber sockeye salmon at the tower site by the first week in August. Salmon escapement counts and district harvests for 1996 are listed in Table 4. From the beginning of the project on August 7 and until the end on September 7, coho escapement counts were significantly

greater than sockeye escapement counts. These results differ from the 1995 run where coho didn't consistently outnumber sockeye in the escapement until August 19 (Appendix Table 2). The 1994 run was similar to this year's run with coho escapement counts consistently outnumbering sockeye counts from August 7 until the end of the project (Appendix Table 3).

The timing of commercial coho harvests in the Egegik District from 1981 to 1996 are listed in Appendix Table 1. On average, 25% of the commercial coho harvest is achieved by August 9, while 50% of the harvest occurs around August 16, and 75% by August 22. For the 1996 run, the 25%, 50% and 75% harvest levels were attained on August 2, 8, and 14, respectively, or about a week earlier than normal. Given that it takes about a week for coho salmon to travel from the commercial district to the counting towers, the 1996 run would have been expected to start showing up in peak numbers, at the towers, sometime around the end of the second week in August. The 1996 coho escapement counts did indeed peak around this time.

AERIAL SURVEY COUNTS

On September 27 and 28 a combined total of 9,043 coho salmon were counted during aerial surveys of the King Salmon River, Egegik River and the Becharof Lake system. Survey conditions were good. The distribution of fish counted by stream is listed in Table 5. Figures 3, 4 and 5 show stream numbers and locations. Of this total, 8,460 or 34% of the 24,900 coho salmon counted at the towers were counted upstream of the towers. The areas with the largest coho concentrations were the Egegik River Rapids, Salmon Creek, and the Kejulik River, each of which had 1,200 or more coho salmon counted in them. These three areas totaled about 67% of the total aerial count past the towers in 1996, 68% in 1995, and 34% in 1994. Adding the aerial counts on Featherly Creek, Burl's Creek, Stream 89.8, Bear Creek, and Becharof Creek to the three major areas above, increases the average percent to over 80%. Though aerial coho counts are only indicators of escapement, aerial surveys are much less expensive than counting towers and they can be an expedient way to document coho escapement. Aerial counts above the counting towers have averaged 41% of the tower counts over the last three years.

1996 COMMERCIAL COHO HARVEST

Preliminary figures indicate that the 1996 commercial coho harvest was approximately 39,300 fish, or slightly below the 1981 to 1995 average of 43,100. Commercial coho catch rates were average and the fishery remained on its normal four-day weekly schedule throughout the entire season. However, by the end of August, buyer interest was quite low and the last commercial salmon purchase was made on August 29.

RECOMMENDATIONS

This was the last year of the USFWS and ADF&G agreement to count coho salmon with counting towers and it is recommended that this expensive and time consuming method to count a few thousand coho salmon not be continued. Instead, it is recommended that aerial surveys be continued, which are less expensive and more expeditious in documenting coho salmon escapements.

Aerial spawning ground surveys during the last three years have exposed three places that consistently give the highest counts; Egegik River Rapids, Kejulik River and Salmon Creek. Several other areas with good numbers of coho salmon observed, include: Featherly Creek, Burl's Creek, Stream 89.8, Bear Creek and Becharof Creek. Survey efforts should focus on these areas for baseline data in establishing indices of coho escapement. Other areas could be surveyed as more time and money are made available.

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Table 1. Egegik River salmon escapement counts, Egegik Tower, 1996.

Date	Daily Counts				
	Sockeye	Chinook	Chum	Pink	Coho
19-Jun	11,220	0	0	0	0
20-Jun	10,650	0	0	0	0
21-Jun	90	0	0	0	0
22-Jun	1,260	0	0	0	0
23-Jun	21,174	0	0	0	0
24-Jun	27,378	0	0	0	0
25-Jun	24,468	0	0	0	0
26-Jun	2,298	0	0	0	0
27-Jun	888	0	0	0	0
28-Jun	37,176	0	0	0	0
29-Jun	35,868	0	0	0	0
30-Jun	34,434	0	0	0	0
1-Jul	36,222	0	0	0	0
2-Jul	46,038	0	0	0	0
3-Jul	60,714	0	0	0	0
4-Jul	31,116	0	0	0	0
5-Jul	17,202	0	0	0	0
6-Jul	8,604	0	0	0	0
7-Jul	34,686	6	0	0	0
8-Jul	51,342	0	0	0	0
9-Jul	62,250	0	0	0	0
10-Jul	234,648	0	0	0	0
11-Jul	226,074	18	0	0	0
12-Jul	20,688	0	6	0	0
13-Jul	2,370	0	0	6	0
14-Jul	3,270	0	0	0	0
15-Jul	9,564	0	0	0	0
16-Jul	17,790	6	6	0	0
17-Jul	6,114	6	0	0	0
18-Jul to 6 Aug ^a					
7-Aug	60	12	0	12	876
8-Aug	18	0	0	0	564
9-Aug	48	12	0	0	468

-continued-

Table 1. (page 2 of 2)

Date	Daily Counts				
	Sockeye	Chinook	Chum	Pink	Coho
10-Aug	36	12	0	0	174
11-Aug	36	0	0	0	660
12-Aug	108	0	0	30	1,176
13-Aug	36	0	0	2,370	624
14-Aug	18	6	0	4,236	198
15-Aug	18	0	0	4,890	1,020
16-Aug	30	0	0	5,484	402
17-Aug	96	0	0	9,864	1,086
18-Aug	48	0	0	12,708	1,032
19-Aug	30	0	0	18,384	1,386
20-Aug	54	6	0	11,232	2,016
21-Aug	36	18	0	6,510	1,038
22-Aug	6	0	0	4,536	1,002
23-Aug	12	0	0	2,634	798
24-Aug	36	0	0	3,864	618
25-Aug	36	0	0	5,730	720
26-Aug	18	0	0	1,482	1,248
27-Aug	12	0	0	396	696
28-Aug	0	0	0	1,752	882
29-Aug	6	0	0	1,176	678
30-Aug	18	0	0	1,380	918
31-Aug	12	0	0	840	1,134
1-Sep	12	6	0	714	426
2-Sep	12	0	0	1,008	444
3-Sep	6	6	0	504	498
4-Sep	0	0	0	444	528
5-Sep	0	0	0	180	408
6-Sep	0	0	0	138	420
7-Sep	0	0	0	114	96
8-Sep	0	0	0	54	240
9-Sep	6	0	0	162	168
10-Sep	0	0	0	210	180
11-Sep	0	0	0	72	96
TOTAL	1,076,460	114	12	103,116	24,918

^aCounting towers were not operated from July 18 to August 6.

Table 2. Coho salmon escapement counts, Egegik River, 1996.

Date	Daily Counts	Cumulative Total	Daily % of Total	Cumulative Percent	Comments
7-Aug	876	876	3.52	3.52	USFWS funding began
8-Aug	564	1,440	2.26	5.78	
9-Aug	468	1,908	1.88	7.66	
10-Aug	174	2,082	0.70	8.36	
11-Aug	660	2,742	2.65	11.00	
12-Aug	1,176	3,918	4.72	15.72	
13-Aug	624	4,542	2.50	18.23	
14-Aug	198	4,740	0.79	19.02	
15-Aug	1,020	5,760	4.09	23.12	
16-Aug	402	6,162	1.61	24.73	
17-Aug	1,086	7,248	4.36	29.09	
18-Aug	1,032	8,280	4.14	33.23	
19-Aug	1,386	9,666	5.56	38.79	
20-Aug	2,016	11,682	8.09	46.88	
21-Aug	1,038	12,720	4.17	51.05	
22-Aug	1,002	13,722	4.02	55.07	
23-Aug	798	14,520	3.20	58.27	
24-Aug	618	15,138	2.48	60.75	
25-Aug	720	15,858	2.89	63.64	
26-Aug	1,248	17,106	5.01	68.65	
27-Aug	696	17,802	2.79	71.44	
28-Aug	882	18,684	3.54	74.98	
29-Aug	678	19,362	2.72	77.70	
30-Aug	918	20,280	3.68	81.39	
31-Aug	1,134	21,414	4.55	85.94	
1-Sep	426	21,840	1.71	87.65	
2-Sep	444	22,284	1.78	89.43	
3-Sep	498	22,782	2.00	91.43	
4-Sep	528	23,310	2.12	93.55	
5-Sep	408	23,718	1.64	95.18	
6-Sep	420	24,138	1.69	96.87	
7-Sep	96	24,234	0.39	97.25	
8-Sep	240	24,474	0.96	98.22	
9-Sep	168	24,642	0.67	98.89	
10-Sep	180	24,822	0.72	99.61	
11-Sep	96	24,918	0.39	100.00	
Totals	7,500,318		100.00		

Table 3. Commercial salmon catch by date and species, in numbers of fish, Egegik District, Bristol Bay, from July 17 to August 29, 1996.

Date	Hrs.	Effort ¹		Sockeye	Chinook	Chum	Pink	Coho	Total
		Drift	Set						
17-Jul	15.0	328	153	120,363	1	2,502		596	123,462
18-Jul	24.0	299	197	84,732		2,427		412	87,571
19-Jul	9.0	109	87	25,364		1,084		53	26,501
22-Jul	15.0	178	108	34,335	4	2,543	36	216	37,134
23-Jul	24.0	168	100	26,108	3	2,342	16	507	28,976
24-Jul	24.0	75	87	12,407		107	1	328	12,843
25-Jul	24.0	44	59	8,515		17		308	8,840
26-Jul	9.0	12	19	1,481		13		173	1,667
29-Jul	15.0	14	9	1,802		4		505	2,311
30-Jul	24.0	11	17	2,539	1	168		1,930	4,638
31-Jul	24.0	10	26	1,023		47		1,197	2,267
1-Aug	24.0	4	6	1,718	1	49		2,052	3,820
2-Aug	9.0	2	10	754		21		654	1,429
5-Aug	15.0	9	11	450	1	10		2,070	2,531
6-Aug	24.0	17	25	426	1	21		2,404	2,852
7-Aug	24.0	20	23	822		33		3,542	4,397
8-Aug	24.0	13	23	521		22		2,758	3,301
9-Aug	9.0	3	11	266				870	1,136
12-Aug	15.0	16	21	530		8		3,473	4,011
13-Aug	24.0	10	19	519		18		2,765	3,302
14-Aug	24.0	9	28	510		23		3,512	4,045
15-Aug	24.0	8	18	213		6		2,541	2,760
16-Aug	9.0		3	57				673	730
19-Aug	15.0	8	9	10				1,378	1,388
20-Aug	24.0	7	13	49				1,228	1,277
21-Aug	24.0	5	8	28				795	823
22-Aug	24.0	3	6	5				500	505
23-Aug	9.0	2	4					79	79
26-Aug	15.0	3	9					808	808
27-Aug	24.0	3	9					663	663
28-Aug	24.0	2	5					304	304
29-Aug	24.0	1	1					25	25
Total	615	1,393	1,124	325,547	12	11,465	53	39,319	376,396

¹ Estimated number of deliveries based on daily oral company reports. Preliminary.

Table 4. Comparison of coho salmon percentages in the Egegik District commercial harvest versus coho percentages in the Egegik River tower counts, July 17 to September 11, 1996.

Date	Commercial Harvest (in number of fish) ¹				Escapement Counts (in number of fish)			
	Sockeye	Chum	Coho	Coho %	Sockeye	Chum	Coho	Coho %
17-Jul	120,363	2,502	596	0.5				
18-Jul	84,732	2,427	412	0.5				
19-Jul	25,364	1,084	53	0.2				
22-Jul	34,335	2,543	216	0.6				
23-Jul	26,108	2,342	507	1.8				
24-Jul	12,407	107	328	2.6				
25-Jul	8,515	17	308	3.5				
26-Jul	1,481	13	173	10.4				
29-Jul	1,802	4	505	21.9				
30-Jul	2,539	168	1,930	41.6				
31-Jul	1,023	47	1,197	52.8				
1-Aug	1,718	49	2,052	53.7				
2-Aug	754	21	654	45.8				
5-Aug	450	10	2,070	81.8				
6-Aug	426	21	2,404	84.3				
7-Aug	822	33	3,542	80.6	12	0	876	98.6
8-Aug	521	22	2,758	83.6	0	0	564	100.0
9-Aug	266		870	76.6	12	0	468	97.5
10-Aug					36	0	174	82.9
11-Aug					36	0	660	94.8
12-Aug	530	8	3,473	86.6	108	0	1,176	91.6
13-Aug	519	18	2,765	83.7	36	0	624	94.5
14-Aug	510	23	3,512	86.8	18	0	198	91.7
15-Aug	213	6	2,541	92.1	18	0	1,020	98.3
16-Aug	57		673	92.2	30	0	402	93.1
17-Aug					96	0	1,086	91.9
18-Aug					48	0	1,032	95.6
19-Aug	10		1,378	99.3	30	0	1,386	97.9
20-Aug	49		1,228	96.2	54	0	2,016	97.4
21-Aug	28		795	96.6	36	0	1,038	96.6
22-Aug	5		500	99.0	6	0	1,002	99.4
23-Aug			79	100.0	12	0	798	98.5
24-Aug					36	0	618	94.5
25-Aug					36	0	720	95.2
26-Aug			808	100.0	18	0	1,248	98.6
27-Aug			663	100.0	12	0	696	98.3
28-Aug			304	100.0	0	0	882	100.0
29-Aug			25	100.0	6	0	678	99.1
30-Aug					18	0	918	98.1
31-Aug					12	0	1,134	99.0
1-Sep					12	0	426	97.3
2-Sep					12	0	444	97.4
3-Sep					6	0	498	98.8
4-Sep					0	0	528	100.0
5-Sep					0	0	408	100.0
6-Sep					0	0	420	100.0
7-Sep					0	0	96	100.0
8-Sep					0	0	240	100.0
9-Sep					6	0	168	96.6
10-Sep					0	0	180	100.0
11-Sep					0	0	96	100.0

¹ Catch data is preliminary pending fish ticket compilation.

Table 5. Aerial survey counts of coho salmon escapement, Egegik District, 1996.

Location	Survey Date	Number of Coho Salmon Counted	
Egegik River Drainage ¹			
Egegik Lagoon	27-Sep	40	
Egegik River Rapids	27-Sep	2,800	Many schooled off mouth of Myers Creek.
Stream 148.2	27-Sep	0	
Stream 146.4	27-Sep	0	
Stream 141.5 (Rusty Creek)	27-Sep	22	All schooled off mouth.
Stream 136.8	27-Sep	0	
Stream 131.9	27-Sep	0	
Stream 127.5	27-Sep	0	
Stream 117.5	27-Sep	275	
Stream 115.8 (Featherly Creek)	27-Sep	450	All schooled off mouth.
Stream 112.8	27-Sep	0	
Stream 108.7	27-Sep	150	All schooled off mouth.
Stream 107.6 (Burl's Creek)	27-Sep	350	All schooled off mouth.
Stream 102.1	27-Sep	0	
Stream 101.8	27-Sep	0	
Stream 99.2 (Frank's Creek)	27-Sep	150	All of these schooled off mouth.
Stream 96.2 (Ruth River)	27-Sep	0	
Ruth Lake	27-Sep	145	All schooled off mouths of 2 tributaries.
Stream 95.0	27-Sep	0	
Stream 93.5 (Otter Creek)	27-Sep	0	
Stream 91.9	27-Sep	0	
Stream 90.3 (Salmon Creek)	27-Sep	1,200	Most of these schooled off mouth.
Stream 89.8	27-Sep	200	
Stream 87.0 (Bear Creek)	27-Sep	300	Most of these schooled off mouth.
Stream 86.0	27-Sep	30	All schooled off mouth.
Stream 84.7	27-Sep	125	All schooled off mouth.
Stream 83.9	27-Sep	0	
Stream 81.2 (Cleo Creek)	27-Sep	0	
Stream 73.5 (Becharof Creek)	27-Sep	575	Most of these upstream
Stream 71.3	27-Sep	0	
Stream 48.1 (Kejulik River)	28-Sep	1,638	Includes Margaret & Albert Creeks.
Stream 46.3 (Marie Creek)	27-Sep	4	
Stream 42.2	27-Sep	0	
Stream 35.5	27-Sep	20	All instream.
Stream 35.1	27-Sep	30	All instream.
Shosky Creek			Did not survey.
Swampy Creek			Did not survey.
Sub-total		8,504	
King Salmon River Drainage			
Whale Mountain Creek	28-Sep	122	
Mossy Creek			Did not survey.
Mink Creek			Did not survey.
Gertrude Creek	28-Sep	75	
Kaye's Creek			Did not survey.
Takayoto Creek			Did not survey.
Angle Creek			Did not survey.
Contact Creek	28-Sep	342	
Mainstem King Salmon River			Did not survey.
Sub-total		539	
Grand Total		9,043	

¹ Streams tributary to Becharof Lake are designated by the number of miles between their mouth and the outlet of Becharof Lake (Egegik River) as one travels clockwise around the lake from the outlet. This is the same system of designation used for years by previous investigators.

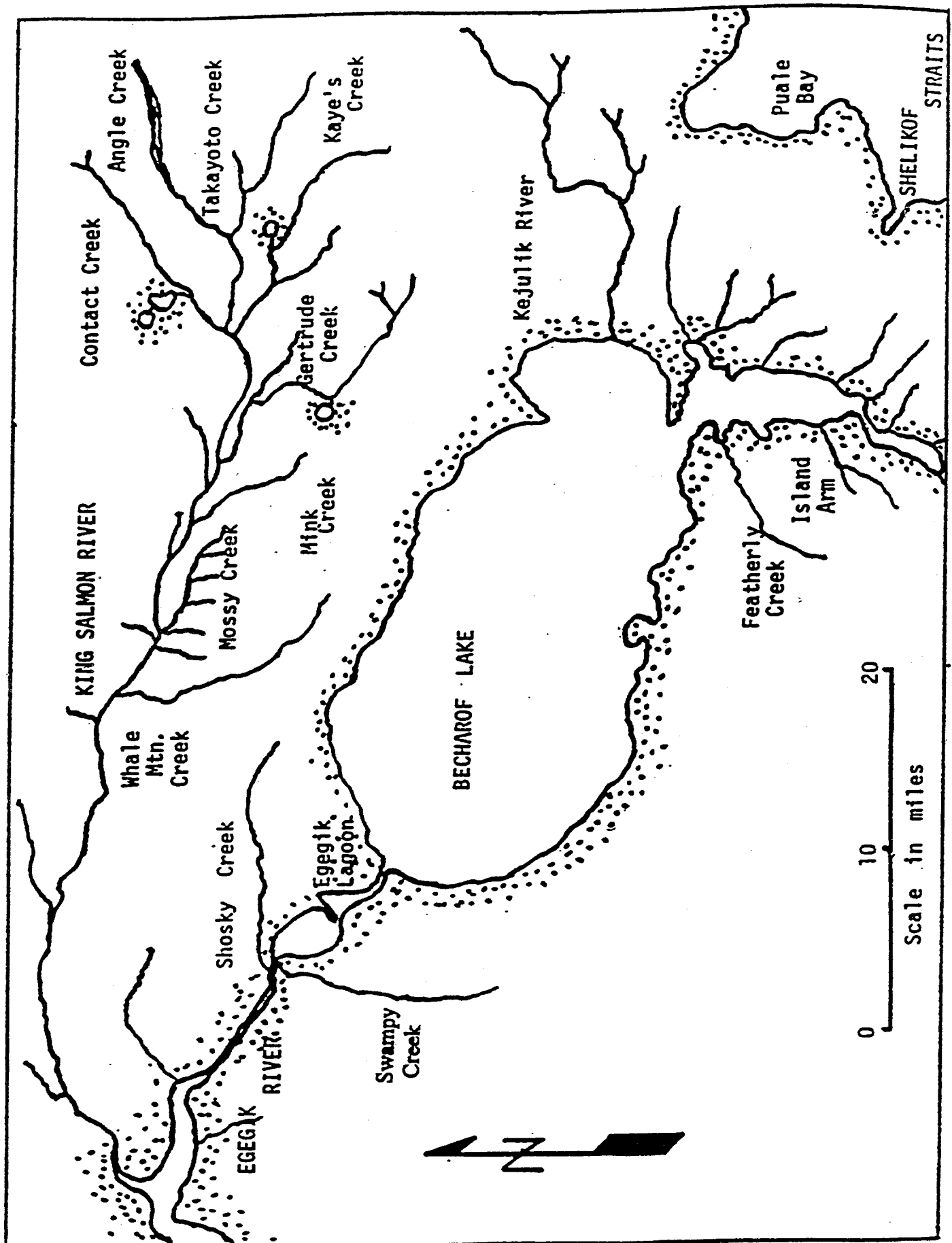


Figure 1. Egegik River drainage, Bristol Bay, Alaska.

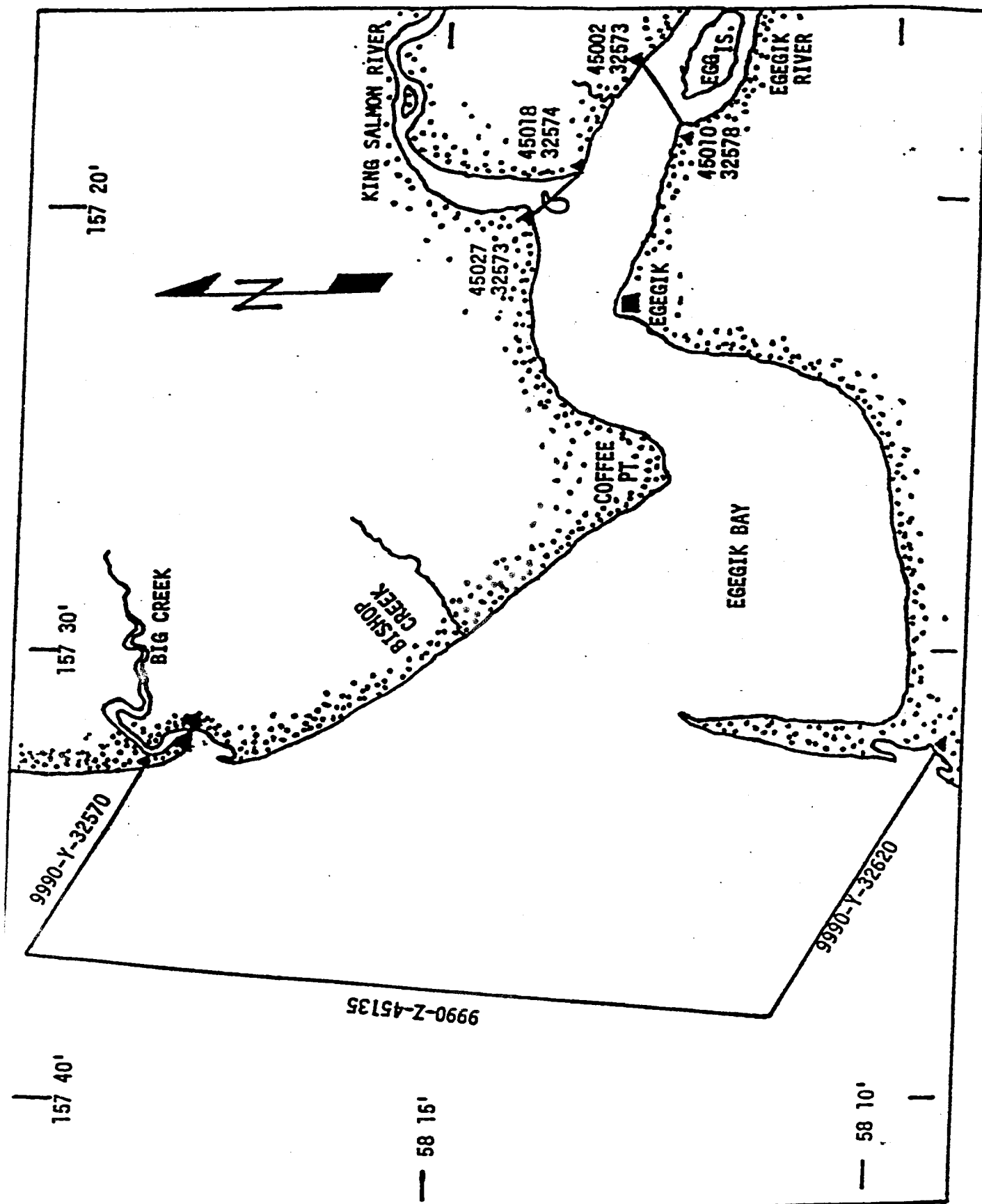


Figure 2. The Egegik District.

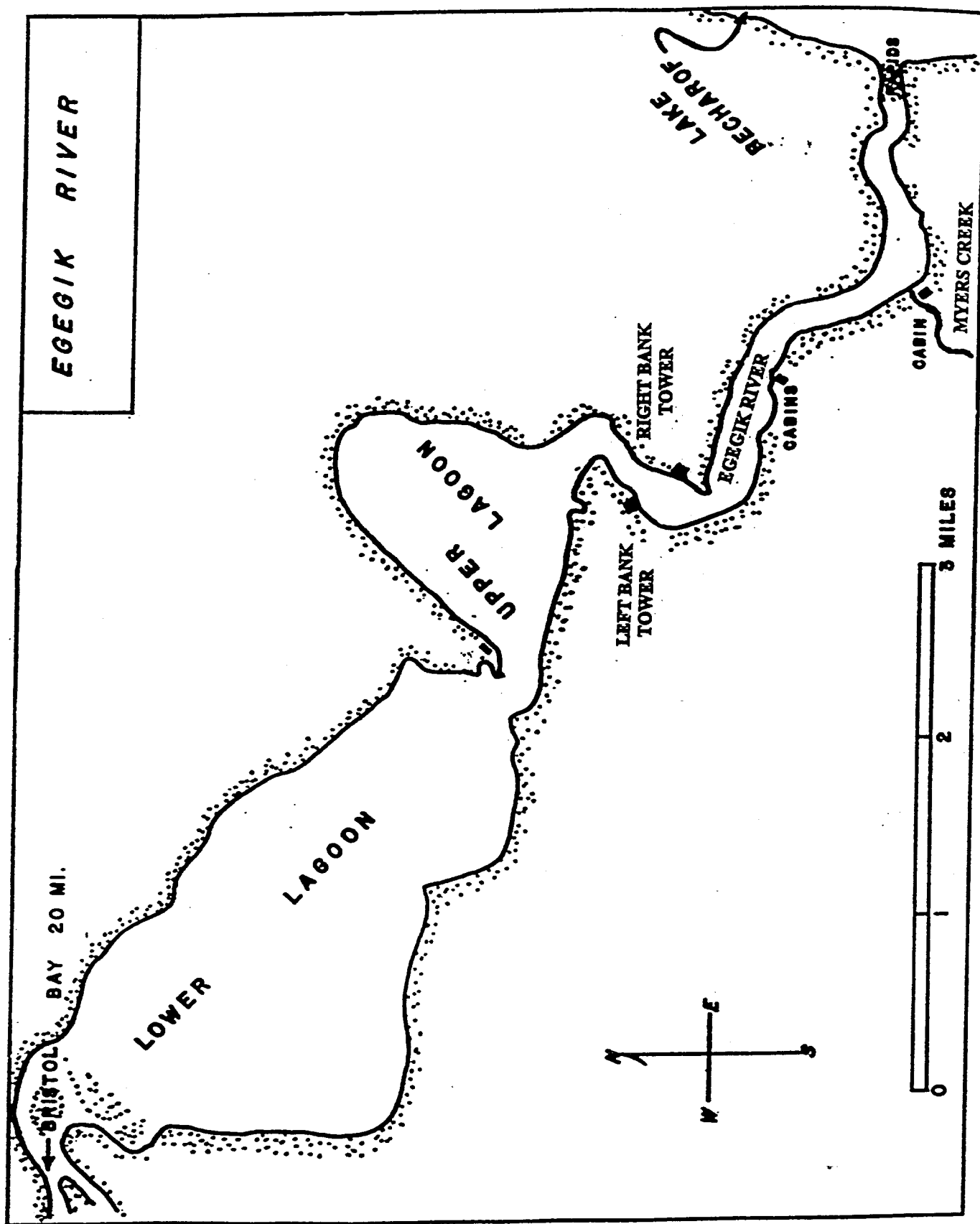


Figure 3. Egegik River and Lagoon showing location of counting towers.

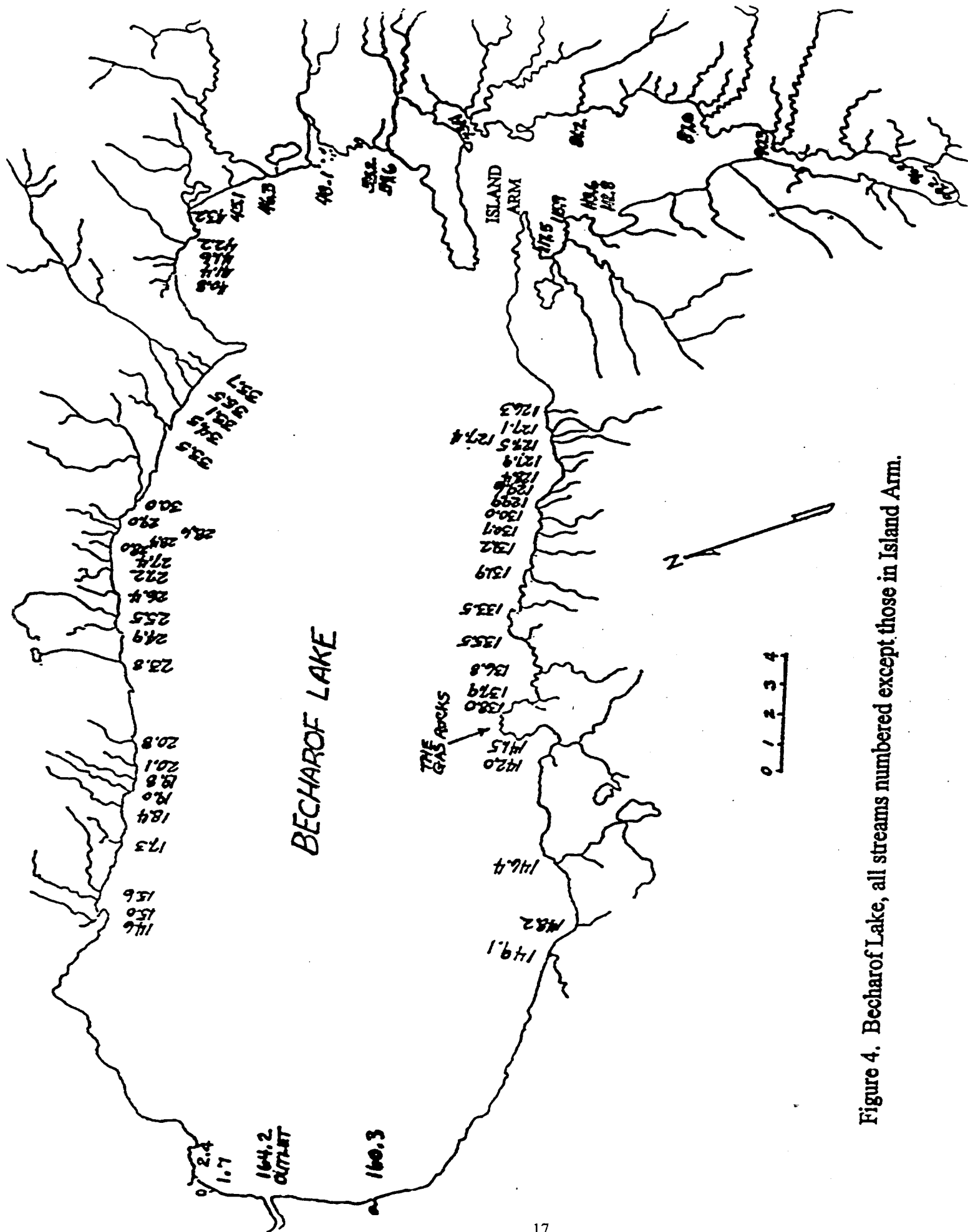


Figure 4. Becharof Lake, all streams numbered except those in Island Arm.

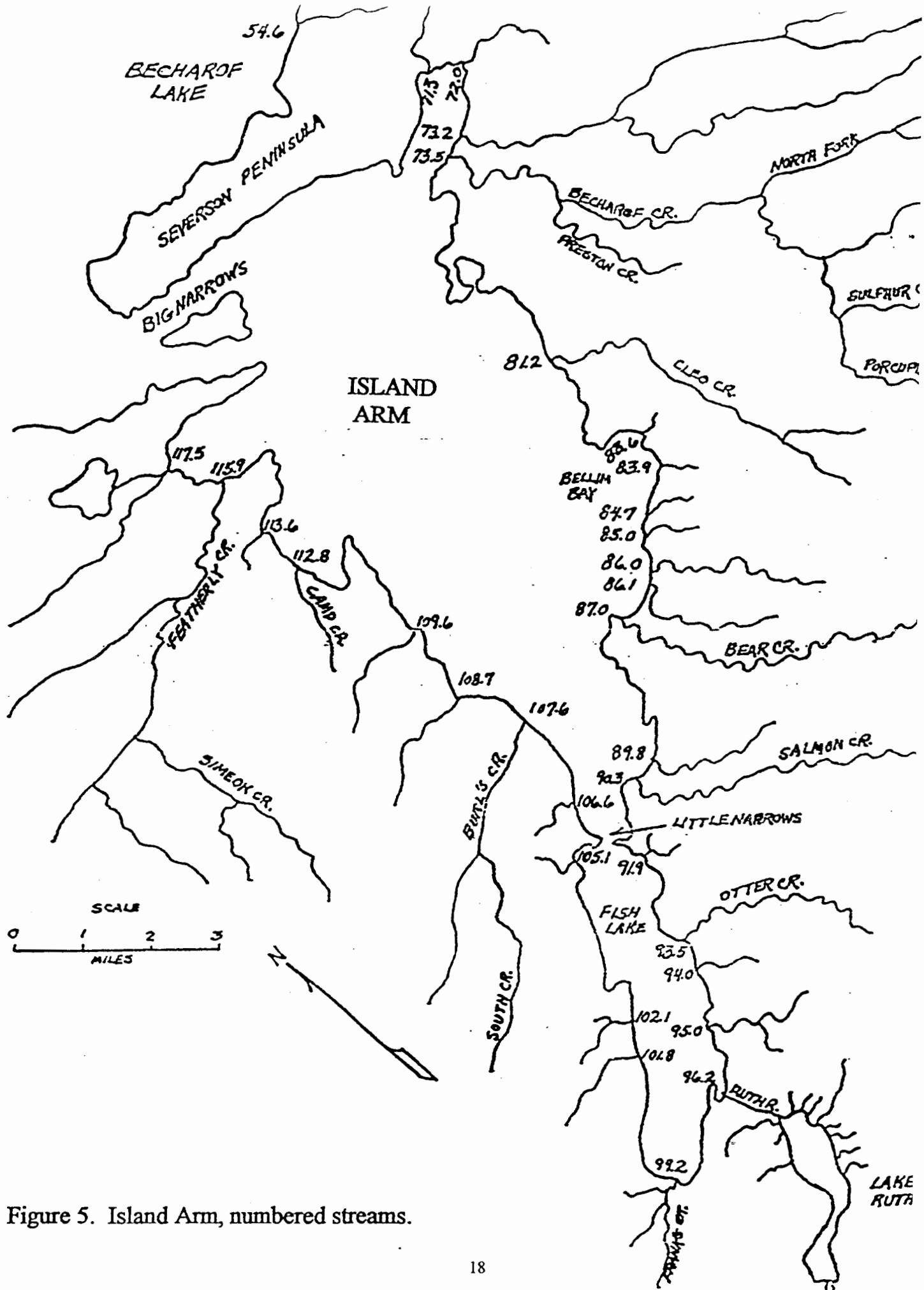


Figure 5. Island Arm, numbered streams.

Appendix Table 1. Coho salmon commercial harvest timing characteristics, Egegik District, 1981 to 1996.

Year	Day Julian of the First Arrival of Cohos in Harvest	Day Julian that Cohos First Out-numbered Sockeye in Daily Harvest	Day Julian 25% of Coho Harvest Achieved	Day Julian 50% of Coho Harvest Achieved	Day Julian 75% of Coho Harvest Achieved	Total Coho Commercial Harvest (No. of Fish)
1981	199	212	219	224	229	32,759
1982	193	208	221	228	235	74,989
1983	194	213	227	232	238	25,954
1984	198	207	219	227	234	66,589
1985	181	212	218	226	234	32,666
1986	186	214	217	223	231	33,607
1987	201	215	224	229	233	30,789
1988	175	214	222	230	237	48,981
1989	190	212	219	226	235	49,175
1990	202	218	225	232	239	43,897
1991	195	217	220	227	233	47,486
1992	199	216	223	225	231	47,780
1993	200	217	223	231	237	41,603
1994	174	216	223	229	237	48,436
1995	205	219	220	226	229	21,810
1981-95 Average	193	214	221	228	234	43,101
	12-Jul	2-Aug	9-Aug	16-Aug	22-Aug	
1996 ^a	195	212	214	220	226	39,319
	14-Jul	31-Jul	2-Aug	8-Aug	14-Aug	

^aPreliminary

Appendix Table 2. Comparison of coho salmon percentages in the Egegik District commercial harvest versus coho percentages in the Egegik River tower counts, July 23 to August 30, 1995.

Date	Commercial Harvest (in number of fish) ¹				Escapement Counts (in number of fish)			
	Sockeye	Chum	Coho	Coho %	Sockeye	Chum	Coho	Coho %
23-Jul	0	0	0		24,972	0	0	0.0
24-Jul	27,544	775	3	0.0	14,784	0	0	0.0
25-Jul	16,731	887	37	0.2	5,964	0	0	0.0
26-Jul	12,714	344	5	0.0	1,104	0	0	0.0
27-Jul	10,594	554	52	0.5	1,308	0	0	0.0
28-Jul	3,728	147	21	0.5	546	0	0	0.0
29-Jul	0	0	0		1,032	0	0	0.0
30-Jul	0	0	0		1,218	6	696	36.3
31-Jul	3,590	183	563	13.0	3,720	0	138	3.6
1-Aug	3,860	148	763	16.0	1,140	0	138	10.8
2-Aug	2,755	141	924	24.2	660	0	324	32.9
3-Aug	822	14	435	34.2	672	0	432	39.1
4-Aug	120	0	75	38.5	342	0	180	34.5
5-Aug	0	0	0		300	0	240	44.4
6-Aug	0	0	0		126	0	312	71.2
7-Aug	934	67	1,899	65.5	726	6	474	39.3
8-Aug	583	44	1,590	71.7	234	0	84	26.4
9-Aug	525	21	1,501	73.3	300	0	150	33.3
10-Aug	422	24	1,511	77.2	96	18	54	32.1
11-Aug	27	0	32	54.2	408	0	150	26.9
12-Aug	0	0	0		354	18	60	13.9
13-Aug	0	0	0		162	0	210	56.5
14-Aug	193	47	1,527	86.4	414	0	402	49.3
15-Aug	261	24	1,533	84.3	138	0	198	58.9
16-Aug	185	12	1,726	89.8	18	18	18	33.3
17-Aug	66	7	2,169	96.7	42	6	42	46.7
18-Aug	1	0	438	99.8	198	42	144	37.5
19-Aug	0	0	0		36	0	42	53.8
20-Aug	0	0	0		66	(6)	78	56.5
21-Aug	43	0	1,646	97.5	66	6	84	53.8
22-Aug	46	0	1,299	96.6	54	0	132	71.0
23-Aug	50	0	1,198	96.0	54	6	48	44.4
24-Aug	37	1	638	94.4	36	0	30	45.5
25-Aug	7	0	225	97.0	42	12	96	64.0
26-Aug					78	6	168	66.7
27-Aug					54	0	912	94.4
28-Aug					18	0	372	95.4
29-Aug					18	0	648	97.3
30-Aug					36 ^a	0	414 ^a	92.0
Totals	85,838	3,440	21,810		61,536	138	7,470	

¹ Catch data is from fish ticket database.

^a Interpolated totals.

Appendix Table 3. Comparison of coho salmon percentages in the Egegik District commercial harvest versus coho percentages in the Egegik River tower counts, July 22 to September 16, 1994.

Commercial Harvest (in number of fish) ¹					Escapement Counts (in number of fish)			
Date	Sockeye	Chum	Coho	Coho %	Sockeye	Chum	Coho	Coho %
22-Jul	81,009	2,946	0	0.0	3,666	0	0	0.0
23-Jul	55,767	1,709	11	0.0	6,066	0	0	0.0
24-Jul	25,674	370	3	0.0	6,900 *	0	0	0.0
25-Jul	37,252	755	189	0.5	6,900 *	0	0	0.0
26-Jul	23,927	571	139	0.6	6,486	0	0	0.0
27-Jul	15,444	345	440	2.7	11,376	0	0	0.0
28-Jul	14,878	499	561	3.5	4,224	0	0	0.0
29-Jul	3,933	48	142	3.4	5,862	0	0	0.0
30-Jul	0	0	0		5,778	0	0	0.0
31-Jul	0	0	0		4,752	0	0	0.0
1-Aug	3,914	188	1,211	22.8	3,306 *	0	0	0.0
2-Aug	2,051	197	1,331	37.2	2,244	0	0	0.0
3-Aug	1,411	198	1,373	46.0	624	0	6	1.0
4-Aug	1,115	110	1,321	51.9	114	0	30	20.8
5-Aug	345	81	495	53.7	258	0	42	14.0
6-Aug	0	0	0		216 *	6	180	44.8
7-Aug	0	0	0		204	18	318	58.9
8-Aug	339	145	1,554	76.3	276	0	336	54.9
9-Aug	261	92	1,446	80.4	90	0	132	59.5
10-Aug	216	129	1,732	83.4	72	0	78	52.0
11-Aug	334	278	2,869	82.4	60 *	0	78	56.5
12-Aug	42	64	585	84.7	66	6	48	40.0
13-Aug	0	0	0		12	0	42	77.8
14-Aug	0	0	0		18	0	24	57.1
15-Aug	115	145	2,858	91.7	0	12	54	81.8
16-Aug	103	138	3,216	93.0	108	0	258	70.5
17-Aug	62	84	3,461	96.0	42	0	378	90.0
18-Aug	28	78	3,171	96.8	42 *	0	258	86.0
19-Aug	3	2	635	99.2	0	0	150	100.0
20-Aug	0	0	0		12	0	252	95.5
21-Aug	0	0	0		24	0	744	96.9
22-Aug	9	7	1,565	99.0	0	0	516	100.0
23-Aug	30	8	2,868	98.7	0	0	384	100.0
24-Aug	13	7	2,687	99.3	0	0	234	100.0
25-Aug	3	0	1,718	99.8	0 *	0	312	100.0
26-Aug	1	0	266	99.6	0	0	546	100.0
27-Aug	0	0	0		0	0	84	100.0
28-Aug	0	0	0		0	0	252	100.0
29-Aug	0	0	2,417	100.0	0	0	678	100.0
30-Aug	0	0	2,360	100.0	0	0	636	100.0
31-Aug	0	0	1,840	100.0	0	0	240	100.0
1-Sep	0	0	1,201	100.0	0 *	0	438	100.0
2-Sep	0	0	570	100.0	0	0	306	100.0
3-Sep	0	0	0		0	0	576	100.0
4-Sep	0	0	0		0	0	414	100.0
5-Sep	0	0	1,134	100.0	0	0	462	100.0
6-Sep	0	0	667	100.0	0	0	234	100.0
7-Sep	0	0	20	100.0	0	0	72	100.0
8-Sep	0	0	85	100.0	0 *	0	102	100.0
9-Sep	0	0	22	100.0	0	0	102	100.0
10-Sep	0	0	0		0	0	0	
11-Sep	0	0	0		0	0	96	100.0
12-Sep	0	0	64	100.0				
13-Sep	0	0	70	100.0				
14-Sep	0	0	45	100.0				
15-Sep	0	0	47	100.0				
16-Sep	0	0	42	100.0				
Totals	187,270	6,248	48,431		66,132	42	10,092	

¹ Catch data from fish ticket database.

* Interpolated totals.

Note: 48 cohos were counted at Egegik Tower prior to July 22, bringing season total count to 10,140 fish.

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